# Homeland Security and Automotive Air Filters

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Following the 9/11 destruction of the World Trace Center Buildings and the subsequent anthrax attack on the Hart Senate Office Building, Homeland Security has become both a national and a personal priority. No one knows when or where the next attack will come, and no one knows the nature of the attack. Besides explosives, chemical, biological, or nuclear materials could be involved.

Upon notification that the Chernobyl accident had spread fission products over large parts of Europe, the LBNL Environmental Health and Safety Department set up a special on-site air sampling station. Sampling times varied from 6 to 24 hours, after which filters were immediately brought to the Low-Background Facility (LBF) for detailed gamma-ray spectrographic analysis.

Similarly, the LBF performed the same kind of analysis on a set of 14 environmental air filters on the LBNL site and an additional site at the Oroville Dam, 180 miles northeast of Berkeley. These sets of filters provided normal background information, including the naturally occurring Be-7 (from cosmic ray interactions in the upper atmosphere) and Pb-210 (from the decay of airborne Rn-222).

Chernobyl debris first appeared on LBNL air filters on 5/9/86 with the appearance of the short-lived nuclides Te-123, I-131, and Ru-103 as well as the long lived Cs-134 and Cs-137. The concentrations observed were, fortunately, small compared to levels of public health concern. This sampling program continued through June 1986, by which time the fallout from Chernobyl declined below detectability.

Recognizing the value of air filters as collectors of fallout; several engine air filters from motor pool cars were analyzed for radioactivity. The car used for the Berkeley-Oroville trip on 5/9 and 5/10 1986 showed 20-25% of the activity of diagnostic nuclides observed at the dedicated LBNL air collection system. The value of automotive air filters as collectors was also recognized in Europe in the aftermath of the Chernobyl accident.

The essence of this experience is that an ubiquitous item from our automotive culture, the intake air filter, can be used as a collector of airborne contamination in the form of chemical, biological, or radiological hazard. At any time, over 100 million such collectors are continuously deployed in a pattern that mimics population distribution and movement. Following an attack, these collectors may be examined for contamination.

The LBF program is to determine how quantitative is the method via a pilot program involving sets of filters obtained from police vehicles from Oroville and Berkeley as well as filters obtained from a local repair shop. The purpose of this is to obtain baseline parameters utilizing the naturally occurring nuclides Be-7 and Pb-210.

Following demonstration of the principle and determination of the background (and time dependent) parameters, a nation wide surveillance system can be established. Local law enforcement vehicles constitute the most readily available set of collectors, and filters could be forwarded to local analysis centers, located at universities, hospitals, reactors, or other sites with access to Ge spectrometers. These sites must be identified beforehand and they must be supplied with some calibration standard, for example potassium chloride.

The facilities and experience at the LBF makes this LBNL facility the proper lead organization to demonstrate and coordinate an effort that should become nation wide to make this 100 million collection sites available and useful in the case of an attack involving radioactivity.

Additional LBNL studies should be added to establish the suitability of this method to detect chemical and biological agents.